4.4 Zone of Siting Feasibility (ZSF)

The EPA site designation guidance manual (EPA 1986) describes the considerations that should be addressed to define a ZSF. Building on information in other publications (e.g., Mathis and Payne 1984), EPA (1986) recommends locating open water disposal sites within an economically and operationally feasible radius from the point of dredging. Other considerations include navigational restrictions, political or other jurisdictional boundaries, distance to the edge of the continental shelf, the feasibility of surveillance and monitoring, and operational and transportation costs (Pequegnat *et al.* 1990).

Long Island Sound is over 100 nautical miles long, with harbors and inlets throughout its 600 miles of coastline (LISS 2003). These harbors and inlets are shallow depositional areas that require periodic dredging to maintain their recreational and commercial use. The overall size of Long Island Sound presents a wide range of haul distances and navigational limitations with respect to dredging project sites (e.g., shallow, non-navigable areas). In addition, several factors limit the dredging schedule in Long Island Sound, including environmental windows, seasonal conditions, and the availability of equipment suitable for dredging federal projects, marinas, and harbors (USACE 2001).

As specified by EPA (1986), development of the ZSF should take into consideration an area which is economically and operationally feasible. As demonstrated in dredged material disposal EISs written for other projects in New England (i.e., Providence River and Harbor Maintenance Dredging Project, Seawolf Class Submarine Homeporting on the East Coast of the United States), disposal of material at open-water or ocean sites located further away from the point of dredging cost more than closer sites due to travel time, fuel costs, and in the case of continental shelf dumping, additional crew costs for trips greater than 12 hours long. In some cases sites located further from the point of dredging also demand the use of larger equipment suited for open ocean travel, which is also an additional cost (i.e., daily rate for use and amount of fuel used is increased).

Most dredging projects throughout Long Island Sound, including some federal and private projects over 26,000 cy, are in shallow non-navigable areas where large ocean suitable tugs and barges can not be operated. In addition, dredging of most Long Island Sound projects is conducted by local area contractors that have small barges and tugs designed for short distance disposal.

Based on these economic and operational reasons EPA eliminated candidate disposal sites outside of 25 nautical miles from a dredging center including those on or beyond the continental shelf break (600-foot depth [200 m]), which is 75 to 150 nautical miles from the dredging centers of Long Island Sound. This is equal to a 10-12 hour round trip (50 nautical miles) for a barge moving at 5 knots.

When the intent to prepare an EIS to evaluate potential open water dredged material disposal site(s) within Long Island Sound was first published in 1999 (FR 64:106, June 3, 1999), it was intended that the EIS would evaluate the existing historically used disposal sites throughout Long Island Sound, known as the Western Long Island Sound (WLIS),

Central Long Island (CLIS), Cornfield Shoals, and New London. Additionally, the EIS was to evaluate other alternatives in these areas, including other open water disposal sites, other types of dredged material disposal and management options, and the no action alternative. The ZSF identified for the EIS (Figure 3-X) using this guidance, included all of Long Island Sound, defined as the area between where the East and Harlem rivers converge in the west and Montauk Point, Long Island to Lewis Point on Block Island and from Sandy Point on Block Island to Point Judith, Rhode Island in the east.

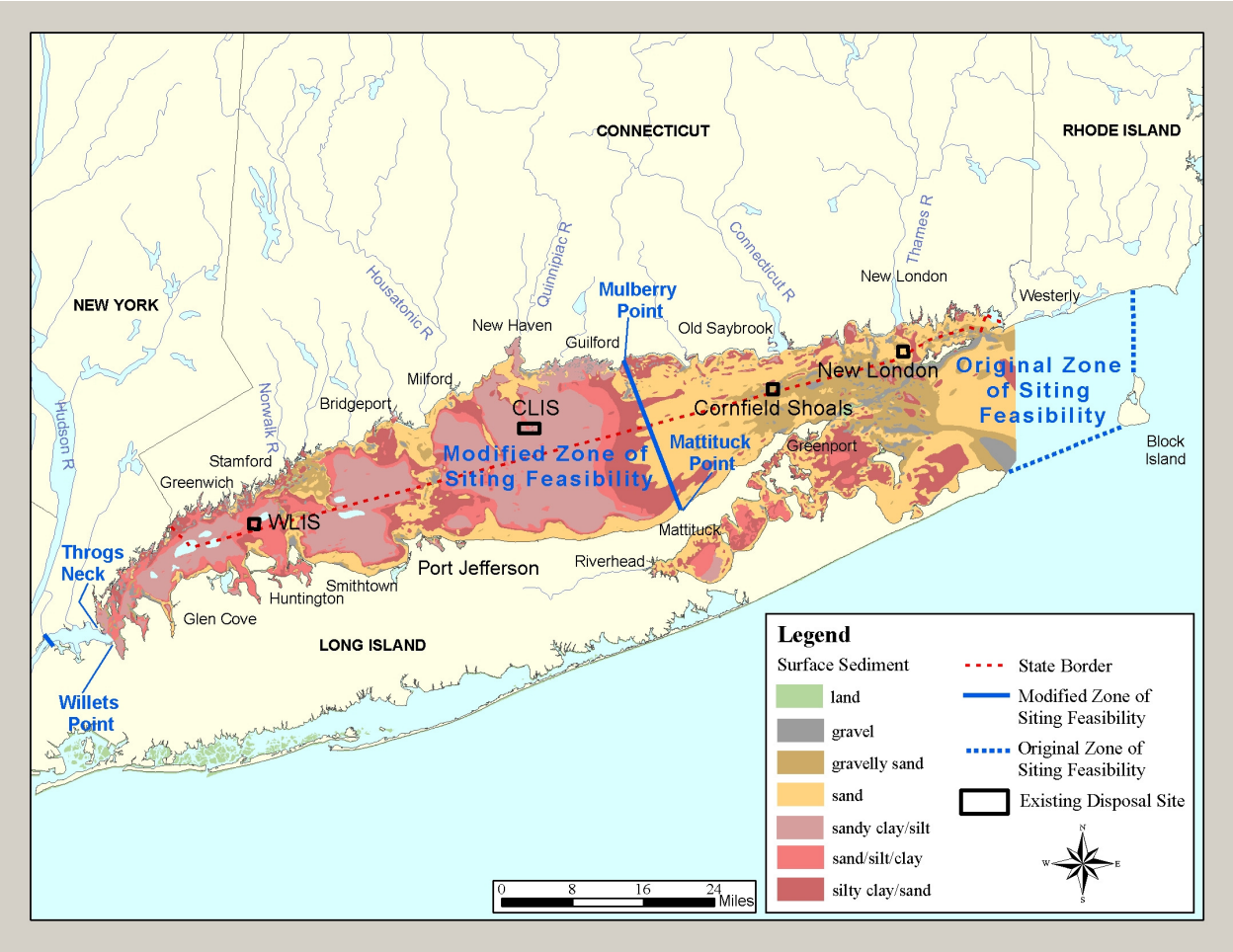

Figure 3-1. Original and Modified Zone of Siting Feasibility

In March 2002, the EPA in conjunction with the Corps and after consultation with the State of Connecticut Department of Environmental Protection and the State of New York Department of Environmental Conservation modified the scope of the current EIS to consider the potential designation of one or more open water dredged material disposal sites for the western and central regions of Long Island Sound (A. Rodney, EPA Region 1, e-mail to LIS EIS mailing, March 27, 2002). The primary reasons for this decision were:

- The disposal needs and alternatives of the central and western Long Island Sound regions are geographically and environmentally separate from those of the eastern Long Island Sound region;
- The need to assess, in a timely manner, the appropriateness of maintaining operational continuity and continued use of a site serving the needs of the central Long Island Sound region.

This change in scope did not preclude consideration of a comprehensive range of alternatives to open water disposal sites for all three Long Island Sound regions (A. Rodney, EPA Region 1, email communication), although it did defer the evaluation for eastern Long Island Sound sites to a later date. As a result, a modified ZSF (Battelle, 2002) was developed. The eastern boundary of the modified ZSF is based on a generalized physiographic boundary between the Central and Eastern Sound. The eastern boundary is marked by a change in sediment texture and depth representing the transition from the depositional basin of the Central Sound into the more active region of the Mattituck Sill and the Eastern Basin (Figure 3-X; USGS, 2002). The United States Geological Survey (USGS) and the Connecticut Geological Survey have described this margin as the transition zone from the depositional processes in the Central Basin to the broadly erosional processes in the Eastern Basin (USGS Open File Report 00-304). This modified ZSF eastern boundary is defined by a line drawn from Mulberry Point, Guilford, CT to Mattituck Point, NY. The western border remained at the junction of the East and Harlem rivers. This modified ZSF also corresponds to an area approximately 25 nautical miles from the western and central Long Island Sound dredging centers.

4.5 Site Screening Process

EPA, in accordance with NEPA, worked with Federal and state agencies to identify specific sites within the ZSF as alternatives to WLIS and CLIS for evaluation in the EIS. Because WLIS and CLIS are currently active dredged material disposal sites in Long Island Sound, they are also included in the alternatives considered in this EIS. The EPA and USACE followed guidance in the MPRSA to facilitate the selection of alternative sites that are sufficiently removed from ecologically sensitive or incompatible use areas to avoid or minimize potential impacts on these areas.

The five general and eleven specific criteria in 40 CFR 228.5 and 40 CFR 228.6 (Table 3-X) guided the process used to identify alternatives (Battelle 2002). Additionally, the Long Island Sound Dredged Material Disposal Site Designation EIS Working Group prepared a summary of evaluation factors for site screening, which included evaluation factors for screening open water sites (EPA and USACE 1999). To facilitate the selection of alternative disposal sites for Long
Island Sound, the environmental considerations from 40 CFR 228.5 and 228.6 and EPA and USACE (1999) were organized to develop a screening process that would:

- Identify areas within the modified ZSF not acceptable for locating an open water disposal site designated under the MPRSA (Tier 1 screening), and
- Identify specific alternative disposal site(s) within the acceptable area(s) for further evaluation in the EIS (Tier 2 screening).

Table 3-X. Required Considerations in the Evaluation and Designation of Ocean Dredged Material Disposal Sites (MPRSA 228.5 and 228.6).

Sec. 228.5 General Criteria for the selection of sites	
(a) The dumping of dredged material into the ocean will be permitted only at sites or in areas selected to minimize the interference of disposal activities with other activities in the marine environment, particularly avoiding areas of existing fisheries or shellfisheries, and regions of heavy commercial or recreational navigation.	
(b) Locations and boundaries of disposal sites will be so chosen that temporary perturbations in water quality or other environmental conditions during initial mixing caused by disposal operations anywhere within the site can be expected to be reduced to normal ambient seawater levels or to undetectable contaminant concentrations of effects before reaching any beach, shoreline, marine sanctuary, or known geographically limited fishery or shellfishery.	
(c) If at any time during or after disposal site evaluation studies, it is determined that existing disposal sites presently approved on an interim basis for ocean dumping do not meet the criteria for site selection set forth in Section 228.5 through 228.6, the use of such sites will be terminated as soon as suitable alternate disposal sites can be designated.	
(d) The sizes of ocean disposal sites will be limited in order to localize for identification and control any immediate adverse impacts and permit the implementation of effective monitoring and surveillance programs to prevent adverse long-range impacts. The size, configuration, and location of any disposal site will be determined as a part of the disposal site evaluation or designation site study.	
(e) USEPA will, wherever feasible, designate ocean dumping sites beyond the edge of the Continental shelf and other such sites that have been historically used.	
Sec. 228.6 Specific criteria for site selection	
(a) In the selection of disposal sites, in addition to other necessary or appropriate factors determined by the Administrator, the following factors will be considered:	
(1)	Geographical position, depth of water, bottom topography and distance from coast;
(2)	Location in relation to breeding, spawning, nursery, feeding or passage areas of living resources in adult or juvenile phases;
(3)	Location in relation to beaches and other amenity areas;
(4)	Types and quantities of wastes (dredged material) proposed to be disposed of, and proposed methods of release, including methods of packaging the waste (dredged material), if any;
(5)	Feasibility of surveillance and monitoring;
(6)	Dispersal, horizontal transport and vertical mixing characteristics of the area, including prevailing current direction and velocity, if any;
(7)	Existence and effects of current and previous discharges and dumping in the area (including cumulative effects);
(8)	Interference with shipping, fishing, recreation, mineral extraction, desalination, fish and shellfish culture, areas of special scientific importance and other legitimate uses of the ocean;
(9)	The existing water quality and ecology of the site as determined by available data or by trend assessment or baseline surveys;
(10)	Potentiality for development or recruitment of nuisance species in the disposal site;
(11)	Existence at or in close proximity to the site of any significant natural or cultural features of historical importance.
(b) The results of a disposal site evaluation and/or designation study based on the criteria stated in paragraphs (1) – (11) will be presented in support of the site designation promulgation as an environmental assessment of the impact of the use of the site for disposal, and will be used in the preparation of an environmental impact statement for each site where such a statement is required by EPA policy. By publication of a notice in accordance with this Part 228, an environmental impact statement, in draft form, will be made available for public comment not later than the time of publication of the site designation as proposed rulemaking, and a final EIS will be made available at the time of final rulemaking.	

Site screening and potential alternatives were identified by Federal and state agencies at a meeting held at the offices of the Connecticut Department of Environmental Protection in Hartford, CT on May 16, 2002. Participating agencies included EPA Regions 1 and 2, the Corps, National Marine Fisheries Service, Connecticut Department of Environmental Protection, New York State Department of Environmental Conservation, and New York State Department of State. Full details of the screening process and results can be found in Appendix D *Alternative Site Screening*.

Data from various studies throughout Long Island Sound including some studies conducted by the State of Connecticut, and where available State of New York, were included in the site screening process. When data were not available for both Connecticut and New York state waters, it was so noted during the discussion and additional efforts were made to obtain any available data layers for review.

4.5.1 Tier 1 Screening

Tier 1 screening defined areas within the revised ZSF not acceptable for locating an open water disposal site, thereby reducing the area considered for Tier 2 screening (Battelle 2002) (Figures 3-X and 3-X). The consensus of the Federal and state agencies was that, for site screening purposes, both New York and Connecticut State waters should be given equal consideration [MPRSA 228.6(a)(1)]. The remaining factors used in the Tier 1 screening ruled out areas based on the following:

- The preferred areas for consideration for the alternative disposal sites would be "containment areas[1]" as opposed to "dispersal areas[2]," and water depth would be a surrogate for sediment stability. Waters shallower than 18 meters deep were eliminated from consideration because wave and storm driven bottom currents in these shallow depths in Long Island Sound frequently are strong enough to resuspend bottom sediments and, thus, would be considered "dispersal areas."
- Alternatives would not be placed near beaches, state or Federal Reserve areas, artificial reefs, or other conservation areas [MPRSA 228.6(a)(8), 228.6(a)(3)] (Figure 3-X).
- Pipeline and cable areas, including approved projects yet to be constructed, would be avoided [MPRSA 228.6(a)(8), 228.6(a)(3)]. A minimum 200 ft buffer zone around each pipeline and cable was assumed during the screening (Figure 3-X).
- Shellfishery resource areas would not be considered for alternative sites [MPRSA 228.5(a)] (Figure 3-X).
- Surface sediment texture data could be used to describe Long Island Sound marine habitats. Therefore, hardbottom and gravel areas of the Sound were

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[1] Containment areas have physical and geological features that restrict movement of bottom sediments from the area to surrounding areas. Examples of containment areas are deep holes, or places where currents are so low, sediments are not resuspended.

[2] Dispersal areas have physical and geological features that disseminate materials from its area to surrounding areas. Disposal areas may have high currents that resuspend bottom sediments and carry the out of the area.

considered important marine habitats because they provide topographic relief important to living resources (Figure 3-X). Hard-bottom (rock outcrop) areas in the Sound were also considered fish havens [MPRSA 228.5(a)]

- Areas of erosion and areas of coarse-grained sediments, based on USGS interpretation, were considered. In addition, bottom areas classified as sorting and reworking (resulting from biological, not physical processes) were considered gray areas – not screened out in Tier 1 but given special consideration in Tier 2 [MPRSA 228.6(a)(6)].

Figure 3-4 summarizes the areas removed from consideration by the Tier 1 screening. The areas of the ZSF considered for the Tier 2 evaluations are shaded gray or light blue in Figure 3-4.

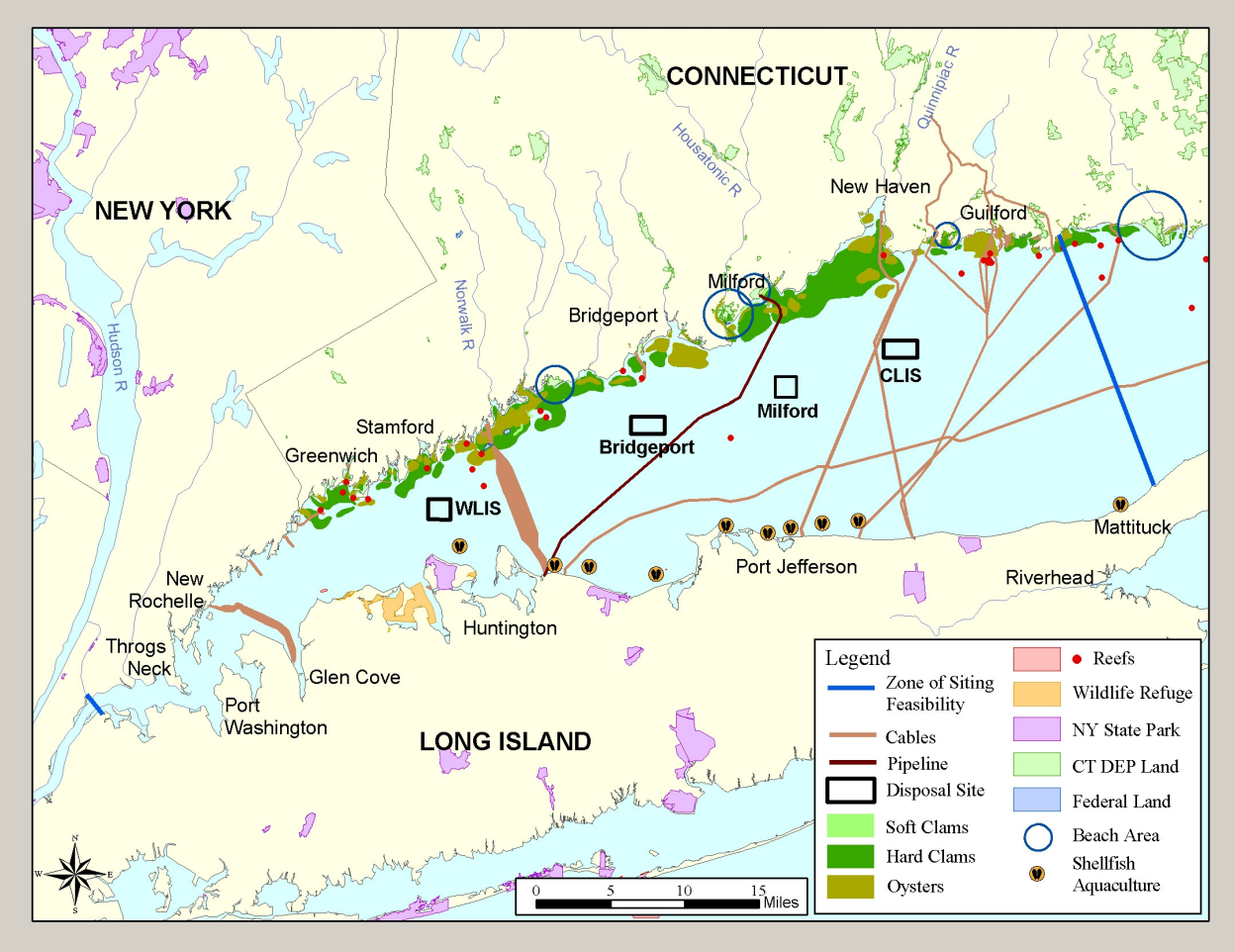

Figure 3-2. Example of GIS Layers Considered Under Tier 1 Screening

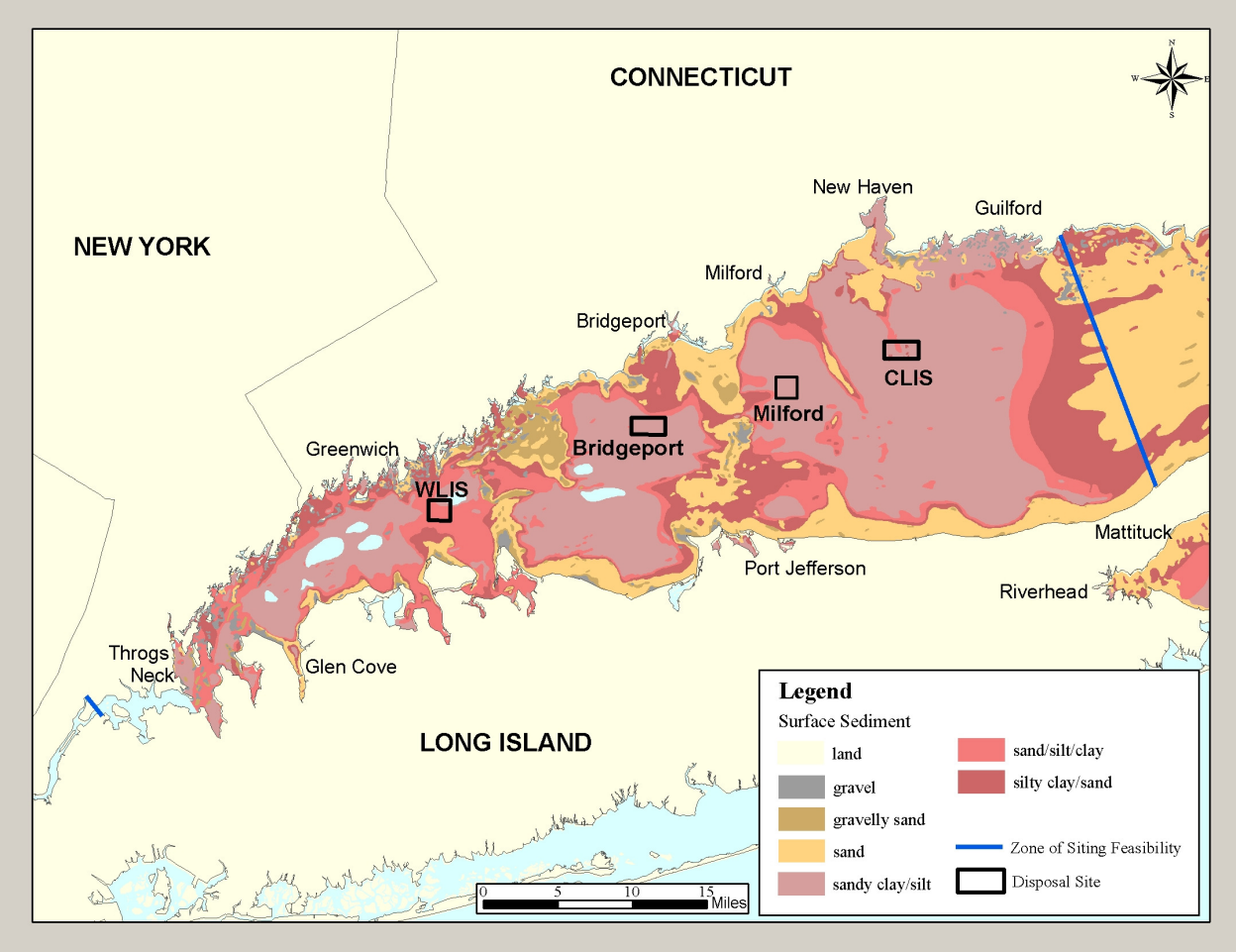

Figure 3-3. Sediment Texture Considered During Tier 1 Screening

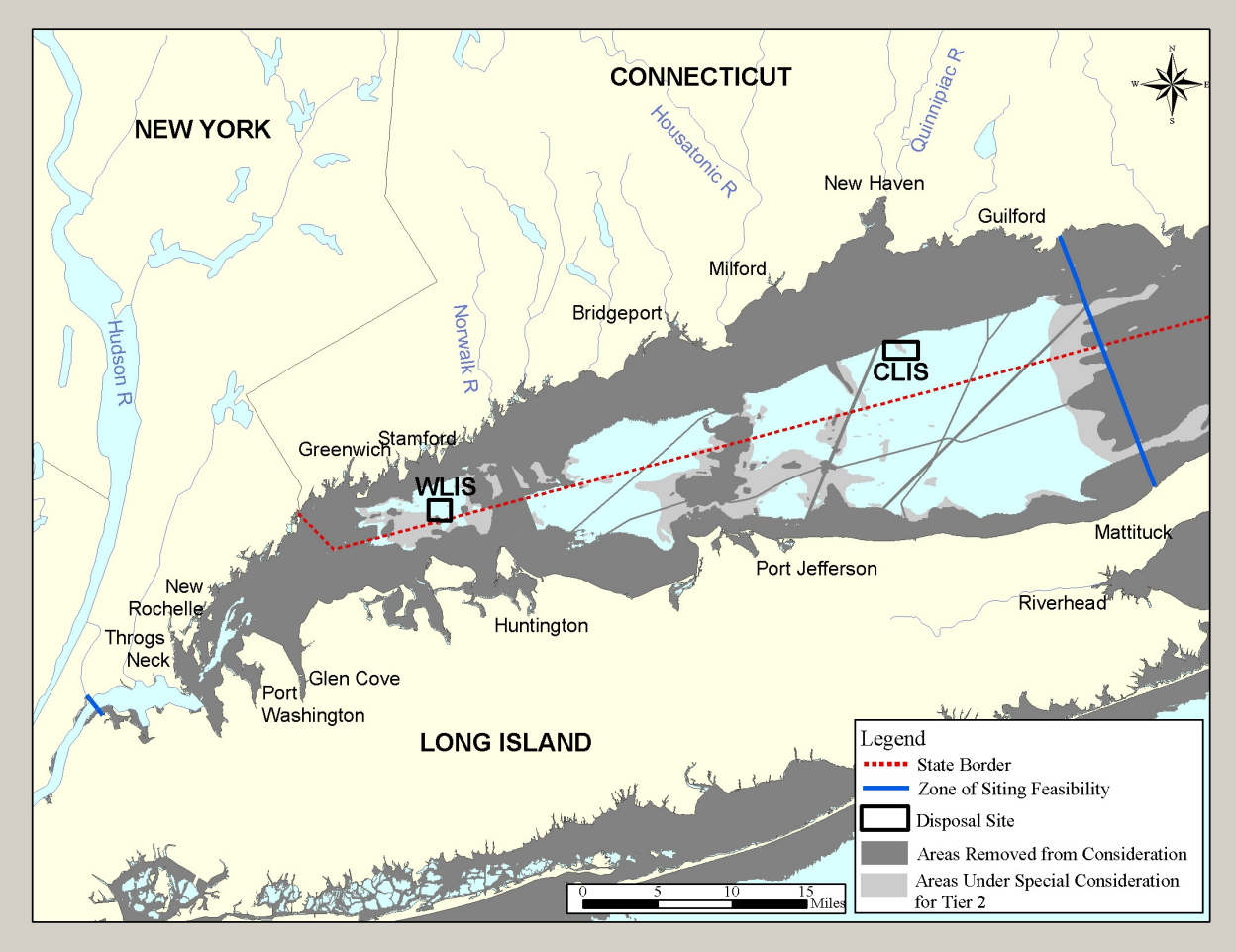

Figure. Areas Removed or Under Special Consideration During Tier 2 Screening

4.5.2 Tier 2 Screening

Tier 2 screening built upon the areas screened during Tier 1 to identify specific alternative disposal site(s) within the acceptable area(s) for further evaluation in the EIS. Factors considered during Tier 2 screening included:

- Historical dump sites [MPRSA 228.5(e)]
- Benthic community, shellfish and fisheries resource areas [MPRSA 228.6(a)(6)]
- Minimizing impacts to archaeological resources [MPRSA 228.6(a)(11)]
- Fish habitat and fish concentrations (e.g. fish catch-per-unit-effort) [MPRSA 228.5(a), 228.6(a)(9), 228.6(a)(8)]
- Living resources (i.e., breeding, spawning, nursery, feeding and passage areas) [MPRSA 228.6(a)(3)]
- Contaminant distribution, bulk sediment properties (texture and total organic carbon) [228.6(a)(6)] (Battelle, 2002).

Because of the large number of historic disposal sites throughout Long Island Sound there was strong agreement among agency members that preference should be given to selecting historic disposal sites in Long Island Sound to avoid modifying bottom type and

habitat of additional areas of the Sound and to address any potential adverse sediment quality issues resulting from historic use of these sites. This consideration is consistent with 40 CFR 228.5(e) which directs EPA to, "*wherever feasible, designate ocean dumping sites … that have been historically used.*" Historic disposal sites in Long Island Sound are presented in Figure 3-X.

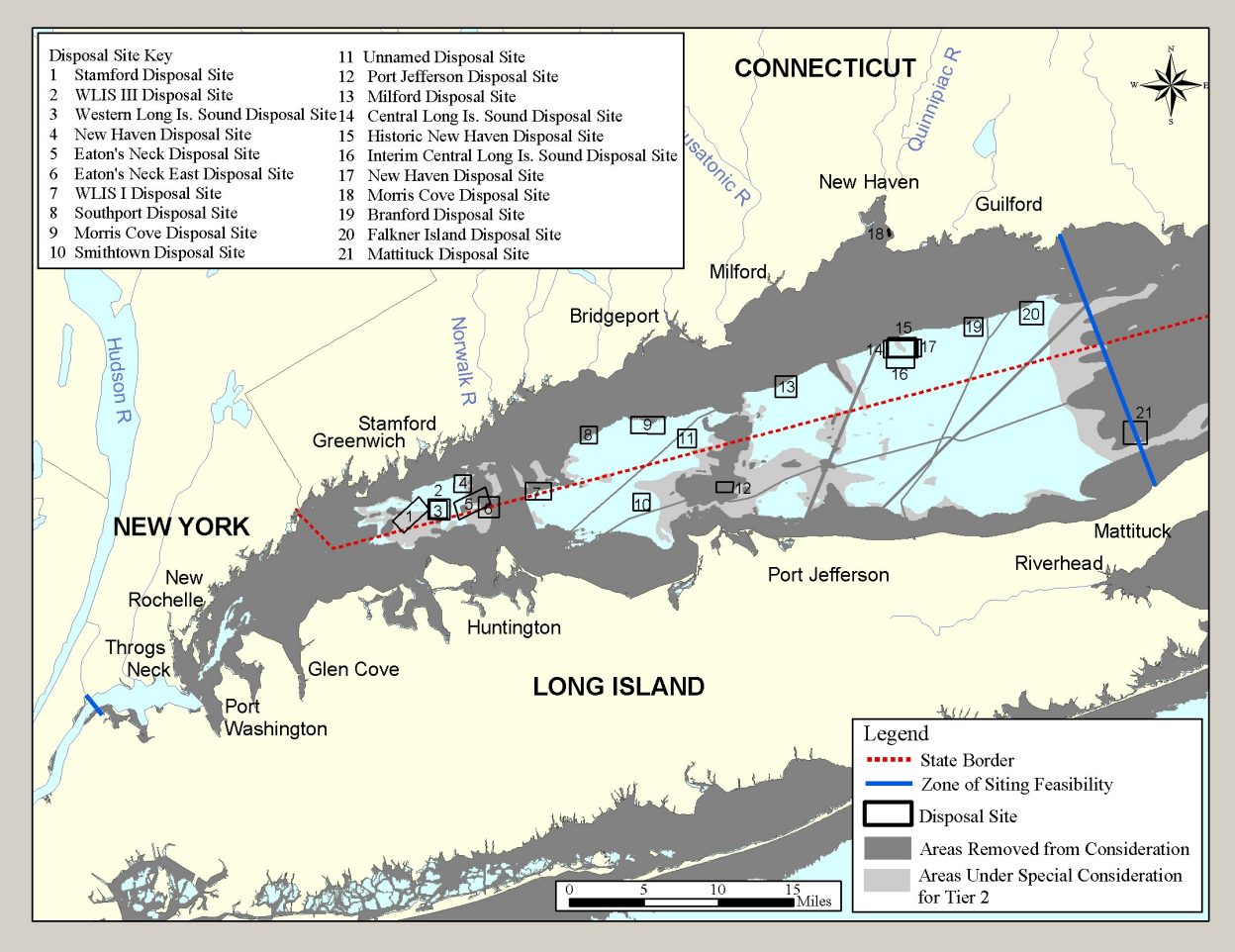

Figure 3-4. Historic Disposal Sites in Western and Central Long Island Sound.

Throughout western and central Long Island Sound there have been 21 historic dredged material disposal sites of which two have been located at the present Western Long Island Sound (WLIS) site (the existing WLIS site and WLIS III) and four have been located at the present Central Long Island Sound (CLIS) site (the existing CLIS site, an Interim CLIS site, a New Haven Disposal site, and a Historic New Haven Disposal site). At the WLIS and CLIS sites, only the currently used sites were assessed, however, based on the findings of the alternative analyses in the EIS, the boundaries of these sites may be modified if the sites are chosen as designated open-water disposal sites and a need for site boundary modification is deemed necessary.

It should be noted that the following historic disposal sites are located in areas screened out during Tier 1 and were therefore, not considered in the Tier 2 screening process.

- Eaton's Neck - This historic disposal site was not considered due to approximately half of its location being within an erosional/nondeposition area and the remaining portion being within an area of known sorting and reworking.
- Eaton's Neck East - This historic disposal site was not considered due to over half of its location being within an erosional/nondeposition area and the remaining portion being within an area of known sorting and reworking.
- Mattituck – This historic disposal site was not considered due to its location within an erosional/nondeposition area.
- Morris Cove - This historic disposal site was not considered due to its location within waters less than 18 meters mean low water.
- Port Jefferson – This historic disposal site was not considered due to its location within an erosional/nondeposition area.
- Smithtown - This disposal site was removed from consideration because, based on USACE file data (2002), this site was not actually used as a disposal site.
- Unnamed Disposal Site (Bridgeport -East) - This 1 nm square historic disposal site located east of the larger Bridgeport disposal site was not considered because of of its vicinity to the Iroquois pipeline and potential use of the area for additional pipelines in the future.
- WLIS I – This historic disposal site was not considered due to its location within an erosional/nondeposition area.

Although a small portion of the historic Milford site is located in waters shallower than 18 meters, this was not considered a strong argument against selecting the site as an alternative. However, the agencies did agree that if the site was still under consideration after the Tier 2 screening was completed, adjustment of the site boundaries (towards deeper waters) should occur before evaluation in the EIS.

After the agencies agreed to consider only the historic disposal site alternatives, the available data from the remaining Tier 2 topics were reviewed to determine whether the remaining sites were viable alternatives for this EIS.

While reviewing shellfish bed classification information it was brought to the attention of the agencies that Connecticut restricts shellfish harvesting within 1000 ft of dredged material disposal sites and that areas found to have water quality problems (i.e., bacterial and organic/inorganic contaminants) are closed from the shoreline to the state boundary. Based on this information the agencies felt it was not appropriate to position alternative sites within areas approved for shellfish harvesting. This decision removed the South Norwalk, Southport, Branford, and Faulkner Island disposal sites from consideration as alternatives (Figure 3-X). The shellfish bed classification also would have screened out WLIS I had it not already been removed based on the Tier 1 screening. Although WLIS is shown in Figure 3-X as being in an approved shellfish bed classification, Connecticut Department of Environmental Protection staff at the meeting noted that all active dredged material disposal sites are restricted within Connecticut waters (reverified by personal communication with Lori Romik, CTDEP March 28, 2003). Thus, WLIS remained an alternative for evaluation.

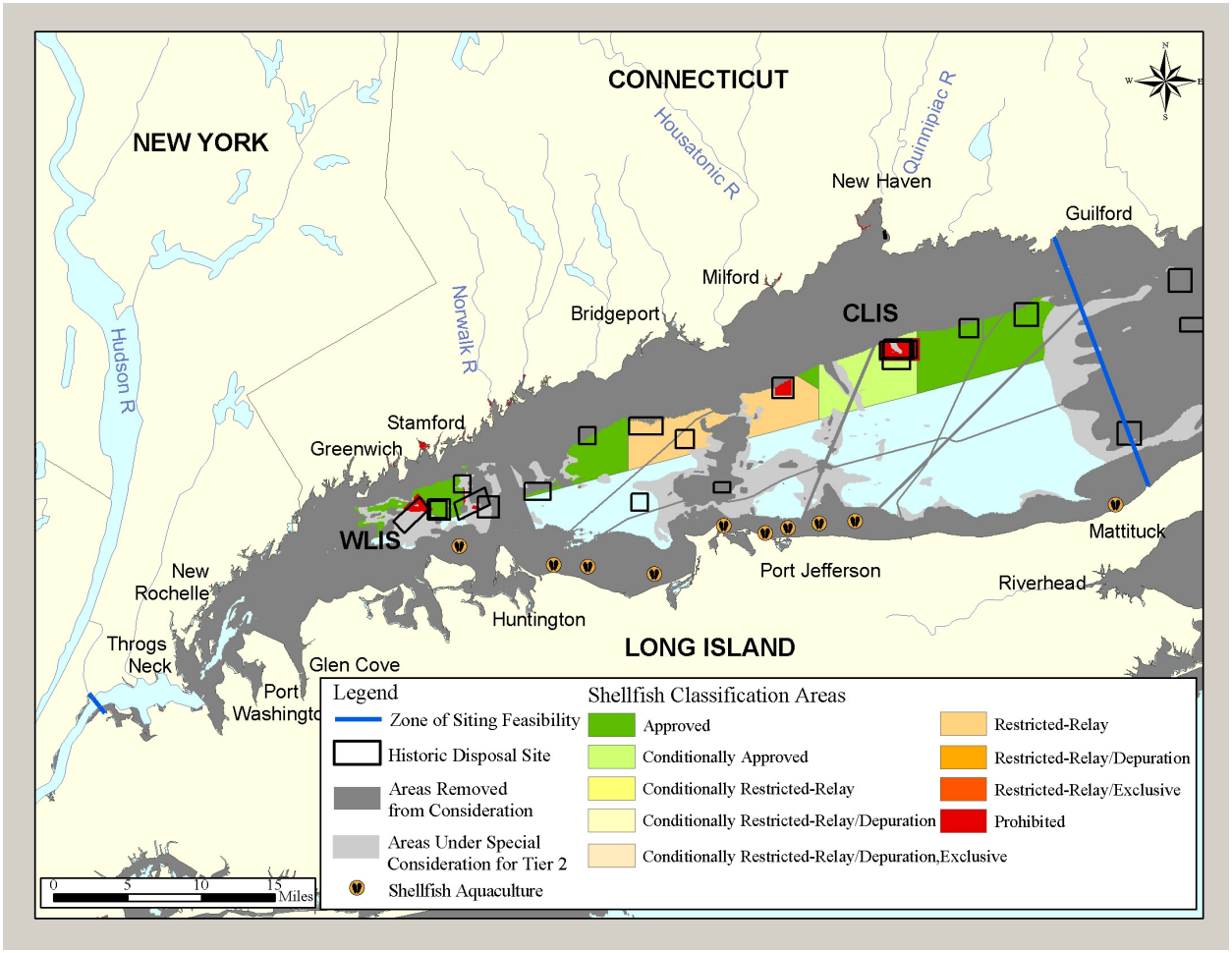

Figure 3-5. Tier 2 Shellfish Bed Classification Site Screening

After eliminating sites from consideration based on shellfish bed classifications, two historic sites Bridgeport and Milford remain along with the existing sites WLIS and CLIS. Review of available data for these sites (archaeological, fish catch per unit effort, benthic community, sediment chemistry, and sediment total organic carbon) showed no additional discriminatory features of the remaining historical sites.

Based on these results the agencies chose to assess the WLIS, Bridgeport, Milford and CLIS sites in the EIS (Figure 3-X). From the site screening, the agencies also determined additional or more recent data needed to be collected for each historic site including: archaeological, benthic community, lobster usage, sediment chemistry, and sediment toxicity data. The Corps subsequently conducted surveys and assessment of these areas. The data from these assessments have been included throughout Chapter 4 of this EIS and in various appendices to this document.

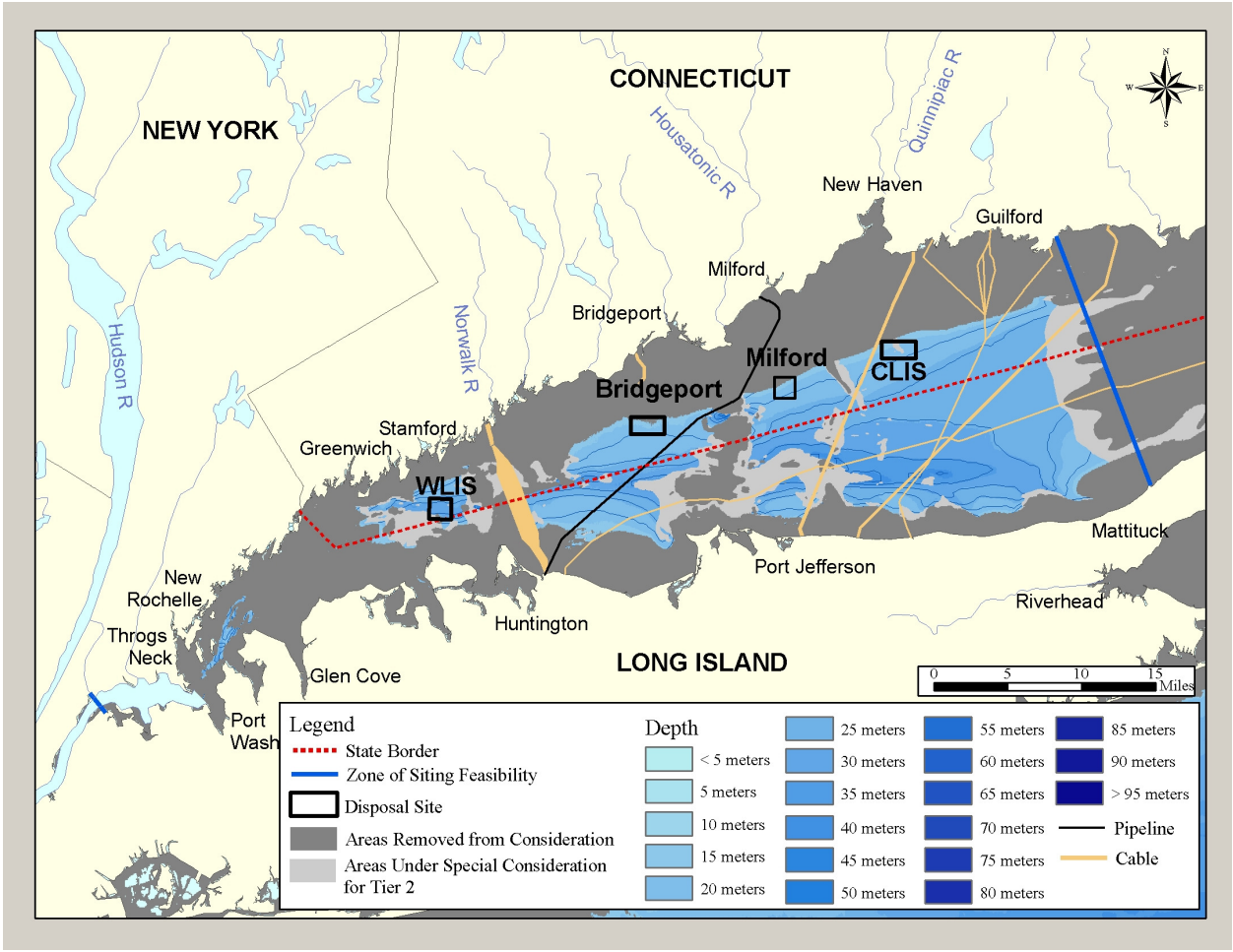

Figure 3-6. Results of Tier 2 Site Screening